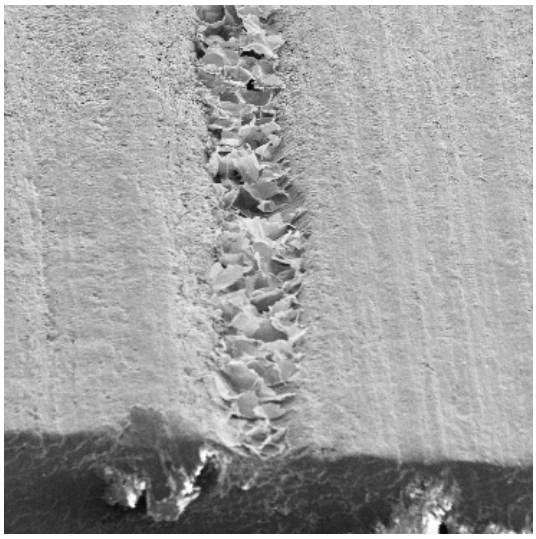
A Microcosm of Ideas
Teachers' Guide



Red Oak Grain

All Grade Levels

There are many other possibilities for research on TECH TREK!

- The Air Force uses SEM technology to study materials, learning how and why things break. They are continually developing new materials, such as carbon composites and titanium alloys, and they want to know how they will perform under extreme temperatures and conditions. They are putting a SEM at every base to allow periodic inspection for wear in critical airplane parts. You could create or request samples of composites for your investigations. You can examine any manmade material, including compact discs, microchips, wood, or money.

- Industrial uses include investigating the chemical composition of the molecules along cracks and researching problems. For example, a contractor observed that concrete made from materials gathered near the fault line in a rock quarry did not perform well. Investigation with an SEM revealed more cracks in these rocks than in those from other areas of the quarry.

- Microscopes are used in forensic analysis to identify fibers, dirt, and gunshot residue. At Mills Lawn Elementary School, we developed a unit in which students catalogued evidence from a make-believe crime and then played a game similar to Clue to determine who was responsible. Incorporate Tech Trek into your Forensic Science unit.

- We have used our microscopes to compare sand from different sources, including five beaches in Hawaii! We have an interesting unit for earth science, in which students study the microstructure of various rocks and minerals.

- Students can compare blood from birds and mammals, including hemophiliac blood. We have bones and other body tissues, including nerves, muscles, tendon, and kidneys.

- People interested in agriculture can examine seed coats and plant tissues. We have an excellent unit comparing monocots, and dicots.

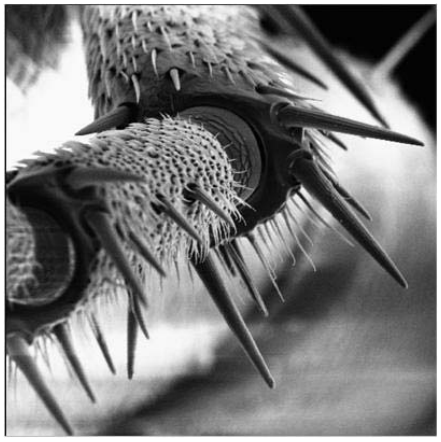
- We compared the life-forms and debris in student-gathered water samples.

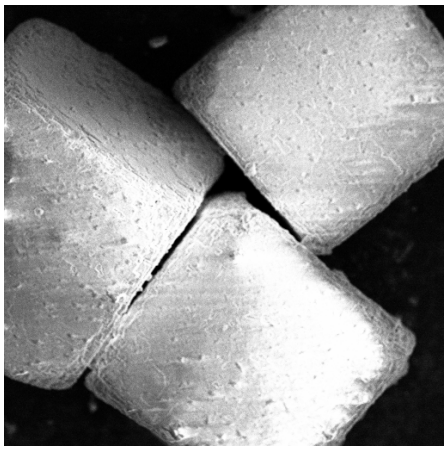
- Elementary students captured live ants, spiders, and other arthropods. We videotaped their movements with computer interfaced light microscopes.

- Teams from area schools used the microscopes to examine their materials in preparation for sending research modules to the space station on Project MISSE, Materials on the International Space Station Experiments.

- Whether you choose one of the teaching activities in this curriculum or develop your own research module, there is something for nearly everyone on TECH TREK Mobile Research Laboratory! We strongly encourage you to work with your students to create Personalized Investigations. Recruit parents or volunteers. Science can be great fun for kids of all ages!

Ant Leg





Salt crystals